What is claimed is:

1. A display using a photoluminescence quenching device, comprising:

a substrate with a plurality of sub-pixels arranged on at least a first side of the substrate, wherein each sub-pixel comprises:

a first electrode having a first polarity;

a second electrode having a second polarity; and

an emitter layer,

wherein the emitter layer is interposed between the first electrode and the second electrode, the emitter layer receives light projected from an excitation light source, the emitter layer emits photoluminescence light, and the photoluminescence light from the emitter layer may be controllably quenched by an electrical field formed by the first electrode and the second electrode.

2. The display of claim 1, wherein the excitation light source is arranged to project light on a second side of the substrate, the substrate is formed of a transparent material, the first electrode is adjacent to the first side of the substrate, the first electrode is formed of a transparent material, and the second electrode is formed of a light-reflecting material.

3. The display of claim 1, wherein the excitation light source is arranged to project light on the first side of the substrate, the first electrode is adjacent to the first side of the substrate and is formed of a light-reflecting material, and the second electrode is formed of a transparent material.

4. The display of claim 1, wherein the excitation light source is arranged to project light on the first side of the substrate, the substrate is formed of a light-reflecting material, and the first electrode and the second electrode are formed of a transparent material.

5. The display of claim 1, wherein the excitation light source is arranged to project light on the first side of the substrate, the substrate is formed of a transparent material, and, a dielectric mirror is arranged on the sub-pixels, wherein light which is emitted from the excitation light source passes through the dielectric mirror and the dielectric mirror reflects light emitted from the emitter layer, and the first electrode and the second electrode are formed of a transparent material.

6. The display of claim 1, wherein the excitation light source is arranged to project light on a second side of the substrate, the substrate is formed of a transparent material, and a dielectric mirror is arranged between the sub-pixels and the substrate, wherein light which is emitted from the excitation light source passes through the dielectric mirror and the dielectric mirror reflects the light emitted from the emitter layer, and the first electrode and the second electrode are formed of a transparent material.

7. The display of claim 1, wherein the photoluminescence quenching device may operate in at least one of a photoluminescence mode where a signal voltage is converted into an electromagnetic wave and a photoluminescence quenching mode where emission of light caused by photoluminescence is controllably quenched.

8. The display of claim 1, wherein the emitter layer is formed of at least one of a low molecular organic material, a light-emitting polymer, and the light-emitting polymer is a material selected from the group comprising polyphenylene vinylene or the group comprising polyfluorene.

9. The display of claim 1, wherein a hole transport layer is interposed between the first electrode and the emitter layer, the first electrode is an anode and the hole transport layer is formed of at least one of polyethylene dioxy thiophene, polystyrene sulfone acid, and polyaniline.

10. The display of claim 1, wherein the excitation light source is a lamp with a high quota of blue light and ultraviolet rays.

11. The display of claim 10, wherein the excitation light source is a mercury lamp or a xenon lamp.

12. The display of claim 1, wherein the excitation light source is an external light source located outside the display.

13. The display of claim 1, further comprising an optical unit which can adjust the light emitted from the emitter layer.

14. The display of claim 1, further comprising a screen on which an image is formed with the light emitted from the emitter layer.

15. The display of claim 5, wherein the dielectric mirror has a bandwidth narrower than a wavelength of the light emitted from the emitter layer.

16. The display of claim 6, wherein the dielectric mirror has a bandwidth narrower than a wavelength of the light emitted from the emitter layer.

17. The display of claim 5, wherein the dielectric mirror includes a plurality of refraction layers having different refractive indices.

18. The display of claim 6, wherein the dielectric mirror includes a plurality of refraction layers, the refraction layers having different refractive indices.

19. The display of claim 17, wherein a low-refractive index refraction layer of the plurality of refraction layers is formed of at least one of silicon dioxide, silicon nitride, and magnesium fluoride, and a high-refractive index refraction layer of the plurality of refraction layers is formed of at least one of titanium dioxide, tin oxide, zirconium oxide, and tantalic oxide.

20. A method for displaying an image using a display using a photoluminescence quenching device, the method comprising:

projecting light emitted from an excitation light source on an emitter layer so that photoluminescence light is emitted from the emitter layer;

controlling emission of the photoluminescence light by generating an electrical field in the emitter layer, thereby quenching at least some of the photoluminescence light; and

displaying an image on a screen using the photoluminescence light emitted from the emitter layer.

21. The method of claim 20, wherein the step of projecting comprises projecting light emitted from a lamp with a high quota of blue light and ultraviolet rays.

22. The method of claim 21, wherein the lamp is a mercury lamp or a xenon lamp.

23. The method of claim 20, wherein the step of displaying of an image comprises adjusting light emitted from the emitter layer using an optical unit.

24. The method of claim 20, wherein the displaying of an image further comprises projecting light emitted from the emitter layer onto the screen.